AMENDMENTS TO THE CLAIMS

The following is a complete listing of all claims in the subject application, with the status of each claim indicated in a parenthetical expression. Claims 7, 9, 10 and 11 currently amended herewith are presented with markings showing the changes made relative to the immediate prior version. Claims 1-6, 8 and 12-26 not being amended are presented in clean version. Claims 27-32 were previously canceled.

1. (Previously Presented) A method for intraoperative neurophysiological monitoring with at least one electrical stimulus probe as an intraoperative aid in defining the course of a nerve structure by monitoring electromyographic activity within a muscle enervated by the nerve structure, comprising:

(a) contacting anatomical tissue with the stimulus probe in an area of the nerve structure;

(b) detecting a change in impedance of the stimulus probe resulting from contact of the stimulus probe with the anatomical tissue ;

(c) triggering a sequence of pre-programmed intraoperative neurophysiological monitoring algorithm steps in response to the detection of the change in impedance of the stimulus probe.

2. (Original) The method for intraoperative neurophysiological monitoring of claim 1, wherein step (c) comprises closing a circuit between a current source and the stimulus probe to provide stimulus current to the nerve structure.

3. (Previously Presented) The method for intraoperative neurophysiological monitoring of claim 1, wherein step (c) comprises:

(c)(1) generating a visible or audible indication of appropriate impedance of the stimulus probe resulting from contact of the stimulus probe with the anatomical tissue.

4. (Previously Presented) A method for intraoperative neurophysiological monitoring with at least one electrical stimulus probe as an intraoperative aid in defining the course of a nerve structure by monitoring electromyographic activity within the nerve structure, comprising:

(a) contacting the nerve structure with the stimulus probe;

(b) detecting a stimulus probe impedance change resulting from said stimulus probe nerve contact;

(c) triggering a sequence of pre-programmed intraoperative neurophysiological monitoring algorithm steps in response to the detection of step (b), wherein step (c) comprises:

(c)(1) generating a visible or audible annunciation of appropriate nerve tissue contact impedance, wherein said step (c) (1) comprises:

(c)(2) generating an annunciation signal to illuminate a Light Emitting Diode.

5. (Previously Presented) The method for intraoperative neurophysiological monitoring of claim 1, wherein step (c) comprises:

(c)(1) initiating generation of a pre-programmed sequence of stimulus pulses to be supplied to the nerve structure via the stimulus probe ; and

(c)(2) storing measured responses to the stimulus pulses collected from an electrode connected to the enervated muscle.

6. (Previously Presented) The method for intraoperative neurophysiological monitoring of claim 5, further comprising:

(c)(3) analyzing the stored, measured responses collected from an electrode connected to the enervated muscle, to determine the average response amplitude.

7. (Currently Amended) The method for intraoperative neurophysiological monitoring of claim 5, further comprising:

(c)(3) analyzing the stored, measured responses collected from an electrode connected to the enervated muscle ~~structures~~, to determine the peak-to-peak response amplitude.

8. (Previously Presented) The method for intraoperative neurophysiological monitoring of claim 5, further comprising:

(c)(3) analyzing the stored, measured responses collected from an electrode connected to the enervated muscle, to determine the response threshold.

9. (Currently Amended) The method for intraoperative neurophysiological monitoring of claim 5, further comprising:

(c)(3) analyzing the stored, measured responses collected from an electrode connected to the enervated muscle ~~structures~~, to determine the response amplitude as a function of stimulus intensity.

10. (Currently Amended) A method for intraoperative neurophysiological monitoring <u>of an anesthetized patient</u>, comprising:

(a) placing a first electrode in a muscle of the patient enervated by a selected nerve;

(b) placing a second electrode in a muscle of the patient not enervated by the selected nerve;

(c) stimulating the selected nerve;

(d) monitoring the ~~effect of said stimulation step as observed from the~~ first electrode for electrical activity and simultaneously monitoring ~~the effect of said stimulation step as observed from~~ the second electrode for electrical activity; and

(e) producing an output signal in response to said monitoring including, producing an output signal indicative of artifact if non-repetitive electrical activity is detected at both the first and second electrodes, producing an output signal indicative of an electromyographic response if non-repetitive electrical activity is detected at the first electrode but not at the second electrode, or producing an output signal indicative of potentially inadequate anesthesia if repetitive electrical activity is detected at both the first and second electrodes ~~actuating an audible or visible alarm if the effect of the stimulation is observed on the first electrode but not on the second electrode~~.

11. (Currently Amended) The method for intraoperative neurophysiological monitoring of claim 10, ~~further comprising:~~ wherein said step of producing an output signal indicative of artifact and said step of producing an output signal indicative of an electromyographic response includes producing the output signals if non-repetitive electrical activity of less than about one second is detected, and said step of producing an output signal indicative of potentially inadequate anesthesia includes producing the output signal if repetitive electrical activity of several seconds or more is detected:

~~(b1) placing a third electrode in a muscle not enervated by the selected nerve; and~~

~~(d1) monitoring the effect of said stimulation step as observed from the first electrode and simultaneously monitoring the effect of said stimulation step as observed from the third electrode~~.

12. (Original) A method for detecting and analyzing a neurophysiological signal in the body, comprising the steps of:

(a) defining a first probe sampling window of time having a first selected duration;

(b) defining a second probe sampling window of time having a second selected duration and being delayed with respect to said first probe sampling window of time by a selected inter-probe interval of time;

(c) contacting a nerve structure in the body;

(d) sensing a continuous and time varying electromyographic waveform from the nerve structure;

(e) storing said nerve structure electromyographic waveform in memory;

(f) rectifying said nerve structure electromyographic waveform; and

(g) generating a continuous threshold waveform by processing the rectified nerve structure electromyographic waveform through said first probe sampling window and through said second probe sampling window and subtracting the instantaneous value of the waveform power in said second probe window from the instantaneous value of the waveform power in said first probe window.

13. (Original) The method for detecting and analyzing a neurophysiological signal of claim 12, further comprising the steps of:

(h) determining whether said continuous threshold waveform includes a first pulse having a first polarity followed by a second pulse having a second polarity by an interval substantially equal to said selected inter-probe interval; and if so,

(i) generating an annunciation indicating that an artifact has been detected.

14. (Original) The method for detecting and analyzing a neurophysiological signal of claim 13, further comprising the steps of:

(j) evaluating the distribution among intelligent and non-intelligent electrodes in response to said annunciation that an artifact has been detected.

15. (Original) The method for detecting and analyzing a neurophysiological signal of claim 12, further comprising the steps of:

(h) determining whether said continuous threshold waveform includes a first pulse having a pulse width substantially equal to said selected inter-probe interval followed by an interval having no pulse and being substantially equal to said selected inter-probe interval; and if so,

(i) generating an indication that no artifact has been detected.

16. (Original) The method for detecting and analyzing a neurophysiological signal of claim 12, wherein said first probe sampling window first selected duration is equal to said second probe sampling window second selected duration.

17. (Original) The method for detecting and analyzing a neurophysiological signal of claim 16, wherein said first probe sampling window first selected duration is in the range of 0.25 seconds to 0.5 seconds.

18. (Original) The method for detecting and analyzing a neurophysiological signal of claim 16, where said selected inter-probe interval is approximately one second.

19. (Original) A method for controlling a neurophysiological monitoring instrument connected to a stimulus probe and one or more electrodes for monitoring electromyographic activity in nerve and muscle structures in the body, comprising:

(a) connecting a first circuit to the stimulus probe for sensing an electrical parameter that changes in response to touching tissue structures in the body, said first circuit being adapted to generate a stimulus probe sensed signal pulse;

(b) connecting a controller connected to said first circuit for receiving said stimulus probe sensed signal, said controller being adapted to execute an algorithm including a plurality of instrument control commands and a plurality of selected patterns of stimulus probe sensed signal pulses;

(c) placing a stimulus probe in proximity to tissue structures in the body;

(d) sensing said electrical parameter changing in response to touching tissue structures in the body;

(e) generating a pattern of stimulus probe sensed signal pulses similar to one of said selected patterns of stimulus probe sensed signal pulses; and

(f) generating an instrument control command in response to detecting said pattern of stimulus probe sensed signal pulses.

20. (Original) The method for controlling a neurophysiological monitoring instrument connected to a stimulus probe of claim 19, wherein said instrument control command changes the instrument display mode.

21. (Original) The method for controlling a neurophysiological monitoring instrument connected to a stimulus probe of claim 19, wherein said instrument control command changes the instrument stimulus signal amplitude.

22. (Original) The method for controlling a neurophysiological monitoring instrument connected to a stimulus probe of claim 19, wherein said instrument control command changes the instrument stimulus signal frequency.

23. (Original) The method for controlling a neurophysiological monitoring instrument connected to a stimulus probe of claim 19, wherein said instrument control command begins generation of a predefined pattern of stimulus signal pulses.

24. (Original) The method for controlling a neurophysiological monitoring instrument connected to a stimulus probe of claim 19, wherein said instrument control command changes the instrument audible annunciation mode, enabling generation of audible tones.

25. (Original) The method for controlling a neurophysiological monitoring instrument connected to a stimulus probe of claim 19, wherein said instrument control

command changes the instrument audible annunciation mode, disabling generation of audible tones.

26. (Original) The method for controlling a neurophysiological monitoring instrument connected to a stimulus probe of claim 19, wherein said instrument control command causes a command represented by an icon on the instrument display screen to be executed.

27-32 (Canceled)